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Research Area: IIR

Duration of Award: 1 Year

Project Title: Accelerating the Development of FHB-Resistant Soft Red Winter Wheat Varieties.

PROJECT 1 ABSTRACT

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The main goal of this project is to release scab-resistant SRW wheat varieties that are adapted to KY and the southern Corn Belt. Achievement of this goal will reduce economic risk for farmers whose crop is at risk for scab infection, for millers and bakers who can tolerate only very low levels of mycotoxin, and for consumers who depend on a safe food supply. In 2003 and 2004, the Kentucky wheat industry was decimated by scab. Millers had difficulty sourcing low toxin grain from Kentucky and farmers were severely discounted.

To meet this overall goal, this breeding pre-proposal has four specific objectives: (1) **screening** : accurately characterizing resistance in existing cultivars, advanced breeding lines and populations by evaluating them under a range of disease pressures at two locations; (2) **breeding**: choosing parents, crossing them and selecting resistant progeny based on phenotype as well as genotype. Parents include sources of native quantitative resistance as well as Sumai-3 derived lines with type II resistance that can be detected with markers and then confirmed phenotypically; (3) **collaboration**: growing and screening collaborative nurseries that facilitate data and germplasm exchange and which broaden the diversity of sources we are using in the breeding program and (4) **outreach**: this has always been an implicit goal of our research but it will be elevated in the present grant through the collaboration with our grains extension specialist who will develop a website and focus on educating growers about the need to grow scab resistant varieties. This pre-proposal also contains an integrated component (VDUN and CBCC) in that advanced breeding lines will be sprayed with a fungicide and phenotyped at two locations.

The relevance of this project to the U.S. Wheat and Barley Scab Initiative is that breeding scab-resistant wheat varieties offers one of the best chances of success in our effort to minimize the threat of FHB to farmers, millers, bakers and consumers of wheat.